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State of Maryland

ORIGINAL (Red)

DEPARTMENT OF THE ENVIRONMENT

201 WEST PRESTON STREET • BALTIMORE, MARYLAND 21201
AREA CODE 301 • 333-2950

William Donald Schaefer
Governor

Martin W. Walsh, Jr.
Secretary

SITE INSPECTION
SAMPLING PLAN
FOR
HONEYWELL, INC.

MD158

PREPARED BY
THE STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
HAZARDOUS AND SOLID WASTE MANAGEMENT ADMINISTRA
CERCLA PRE-REMEDIAL PROJECTS DIVISION

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1.0 PROJECT DESCRIPTION

1.1 Project Objectives and Intended Use of Acquired Data

The purpose of this project is to determine the degree of contamination of soil and groundwater in the proximity of Honeywell, Inc. This information will be used to determine the site's ranking using the EPA Hazard Ranking System (HRS). If the site does not meet the criteria needed to place it on the National Priorities List (NPL), it will be evaluated for further assessment and possible cleanup under the State Superfund Program. During the course of the investigations, if it is determined that an emergency situation arises, emergency measures will be implemented using the Maryland Hazardous Substance Response Plan.

1.2 Background Information Concerning this Study

The site was originally listed in CERCLIS when Honeywell, Inc. notified the USEPA as required under RCRA. Honeywell operated a hexavalent chrome plating operation beginning in 1961. Until 1977, chrome plating wastewaters, caustics, acids, and solvents were disposed of into a dry well waste disposal system in the rear of the facility. After 1977, rinse waters other than those containing chromium were disposed of into the system until 1985. A preliminary assessment of the site was conducted by the State of Maryland in September 1985. Information gathered during the preliminary assessment justified a medium priority site inspection.

In February 1986, Honeywell hired a contractor to perform an investigation of the groundwater environment surrounding the former waste disposal system at the site. A plan outlining the work to be completed was approved by the State of Maryland in July 1986. The work was completed and findings submitted to the State of Maryland in January 1987. In July 1987, Honeywell submitted a Work Plan for further investigative work to be done at the site. The plan was subsequently approved by the Maryland Department of the Environment (MDE). Field work at the site commenced in September 1987.

Preliminary results of site studies indicate soil contamination with metals and VOCs and groundwater contamination with VOCs in the vicinity of the waste disposal system. Honeywell is currently working with the State of Maryland, Department of the Environment regarding further actions to be taken at the site.

1.3 Personnel

1.3.1 Project Organizational Chart and Schedule of Operations (see Figure 1 and 2)

1.3.2 Assigned Tasks (see Figure 3)

1.3.3 Site Contacts

Honeywell, Inc.
2nd. Street Extended
Annapolis, Maryland 21401

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1.3.4 Site Personnel and Safety Plan

1.3.4A - Safety Contacts

Hospital
Anne Arundel General Hospital
Franklin and Cathedral Streets
Annapolis, Maryland 21401
EMERGENCY TELEPHONE: 267-1260

Fire Department
Annapolis City Fire Department
1790 Forest Drive
Annapolis, Maryland 21401
TELEPHONE: 263-7992 or call 911

Police Department
Annapolis City Police Department
199 N. Taylor Avenue
Annapolis, Maryland 21401
TELEPHONE: 268-9000 or call 911

Haz-Mat Unit
Anne Arundel County Fire Department-Haz-Mat Unit
Company #23
Route #2 near College Parkway
Arnold, Maryland 21012
TELEPHONE: 911

State Hazardous Materials and Oil Response Unit
Maryland Department of the Environment
2101 Annapolis Road
Baltimore, Maryland 21230
TELEPHONE: 974-3551

State Police
Barrack "J"
610 Taylor Avenue
Annapolis, Maryland 21401
TELEPHONE: 268-6101

1.3.4B Personnel Protection Level Anticipated

Contamination at the site consists of heavy metals and solvents in soil and groundwater. Level C protection during sampling will be necessary. The protection includes:

- full-faced air purifying respirator;
- chemical resistant clothing;
- chemical resistant gloves;
- chemical resistant boots;
- hard hat.

1.3.4C Contingency Information

Level B protective equipment and first aid equipment are available for unforeseen situations at the site. This equipment will include:

- pressure demand self-contained breathing apparatus;
- chemical protective clothing;
- chemical resistant gloves;
- chemical resistant boots;
- hard hat.

An HNu photoionization detector will be in use during the site investigation to detect the release of volatile organic compounds. The Maryland Hazardous Substance Response Plan, which identifies State, County and Federal responsibilities designed to minimize damage to human health, natural resources and property caused by the release of hazardous substances, will be kept on-site and implemented should an emergency situation arise.

2.0 SITE DESCRIPTION

2.1 Site Location

2.1.1 Description

Honeywell, Inc. Signal Analysis Center is located north of John Hanson Highway (MD Route 50) and south of Defense Highway (MD Route 450). The facility is located one-half mile from the convergence of the North Basin and Broad Creek. Three City of Annapolis drinking water supply wells are within one mile of the site. The site is also located approximately one-quarter mile from the Annapolis Sanitary Landfill.

The Honeywell facility is surrounded by a wooded area. Surface water from the site drains northward to a small unnamed stream which ultimately flows to a tributary to the North Basin of Broad Creek.

2.1.2 Maps (see Figure 4)

2.2 Site Information

2.2.1 Facility Structural Features/Layout

The facility began as a small engineering firm prior to 1956. Electro-International purchased the facility in 1956 and expanded it to its present size. The expansion included the installation of a septic system consisting of septic tanks interconnected with dry wells. Approximately five dry wells and septic tanks were installed between 1956-1961. In 1961, Electro-International added a chrome plating system to the facility. During 1961 and 1962, an additional five structures were installed as part of the septic-dry well system. This septic system was subsequently used for the disposal of plating wastes generated in the plant.

In 1966, Honeywell, Inc. purchased the facility maintaining basically the same operations. Additional dry well structures were added to the waste disposal system in 1975, 1979, 1985, and 1986. By 1986, when all discharge to the system ceased, a total of 16 structures were involved.

The current facility property consists of 54 acres of steeply sloping land which is mostly wooded. The facility building sits on a topographic high point directly south of MD Route 450. The dry well system extends out from the west end of the facility into a wooded area just before the property begins sloping steeply to an unnamed intermittent stream.

2.2.2 Physical Features

The facility building rests on a topographic high point approximately 500 feet south of MD Route 450 and an unnamed tributary to Broad Creek. Honeywell property consists of 54 acres of steeply sloping land which is mostly covered with woods. The site is underlain by stratified, unconsolidated coastal plain sediments of the Aquia and Brightseat formations. MD Route 50-301 borders the site to the south within one-quarter mile. The newly constructed MD Route 97 borders to the west, also within one-quarter mile of the site. A small housing development rests within one-half mile to the west of the site. To the east of the site is a wooded area, then Broad Creek.

2.2.3 Facility Processes (see Site History)

2.3 Site History

Prior to 1956, a small engineering firm, Hopkins Engineering, began operations at the site. Hopkins conducted no plating, but did operate a small laboratory. Electro-International purchased this facility in 1956 and expanded the facility to its present size. This expansion included the

construction of a septic-dry well system involving ten separate structures installed between 1956-1962. The dry wells range in depth from approximately 28-50 feet. In 1961, Electro-International installed a chrome plating line consisting of a caustic cleaning tank, an acid cleaning tank and a chrome plating tank, each of which was equipped with a water rinse tank. Rinse tanks were discharged into the dry well system directly adjacent to the plating shop at the plant.

Honeywell purchased the facility in 1966 maintaining basically the same disposal system until 1977, when Honeywell purchased a Culligan deionizing apparatus which converted hexavalent chrome into trivalent chrome. However, the waste rinse water tanks continued to be discharged into the dry well system until late 1985, when the discharge was discontinued altogether.

During a preliminary assessment site visit in 1985, the cleaning and chrome plating operation was observed. This system had been in use since 1977. In the cleaning operation, the objects to be plated are first dipped into a caustic solution of Bright-Hu and Naldox L-30 in order to remove surface oxides. Then the objects are dipped into a cold water rinse and then into Isoprep 184, a nonchromated deoxidizer/desmutter for aluminum. For the chrome plating operation, the objects to be plated are dipped into tanks containing a hexavalent chrome solution and Iridite 14-2 Al-cat, a cold water rinse, and a hot water rinse. The Iridite forms a protective chromate conversion film on the aluminum object.

Since the time that the preliminary assessment was conducted, Honeywell discovered information indicating the use of the solvent trichloroethene (TCE) in the plating shop from 1966 through 1985. In late 1985, the use of TCE was stopped and 1,1,1-trichloroethane (TCA) was used instead. Honeywell has estimated approximately 5,700 gallons of wastewater containing TCE was discharged into the disposal system.

It was also discovered that waste isopropanol was disposed of onto the ground in an area northeast of the production building from 1977 through 1984.

All discharges to the septic-dry well system from the plating shop were discontinued in 1985, and currently the facility operates a closed loop wastewater system in the plating shop.

2.4 Description of Known and Potential Wastes Present

From 1961 to 1985, plating wastewaters were disposed of into the septic-dry well system in the rear of the facility. These wastewaters contained chromium, lead, and trichloroethene as the contaminants of concern.

In January 1987, Honeywell submitted a preliminary investigation report, entitled "Reconnaissance Investigation of Groundwater Conditions in the Vicinity of Dry Well No. 9." Findings of the report indicated shallow groundwater contamination with volatile organic compounds (VOCs) in each of the five monitoring wells installed. The levels detected range from the detection limit to 2,800 parts per billion (ppb). Subsequently, Honeywell conducted further investigations of the facility and in June 1988, submitted "Investigation of Groundwater, Soils and Wastewater Disposal Systems at the Honeywell Signal Analysis Center." Principal findings of this study indicate that the uppermost aquifer is contaminated with volatile organic compounds. Sludges and liquids found in the septic and dry well structures contain varying levels of VOCs and metals. Dry well #9 contains approximately 18 feet of sludge which contains levels of contaminants several orders of magnitude higher than sludge from the other structures. Levels of VOCs range from a detection limit of 1,000 to 19,670,000 parts per billion. Levels of chrome range from 1,890 to 10,300 parts per million (ppm) and lead from 530 to 870 ppm.

The other eight structures contain two and a half (2.5) feet or less of sludge. Levels of VOCs detected in these structures range from the detection limit to 180 parts per billion. Levels of chrome range from 56 to 177 parts per million and lead from 7 to 95 ppm.

Soil samples taken adjacent to the dry wells also contain detectable levels of these same compounds. Additionally, surface water samples were taken from a drainage ditch which lies at the bottom of the hill between the facility and MD Route 450. The sample analysis revealed the presence of levels of VOCs, primarily TCE, ranging from the detection limit to 5,700 parts per billion.

Samples taken from the former waste isopropanol disposal area indicated the presence of VOCs in levels ranging from the detection limit to 48 ppb. Chrome levels range from 17 to 56 ppm and lead from 8 to 130 ppm.

3.0 POTENTIAL HUMAN HEALTH AND ENVIRONMENTAL IMPACTS FROM THE SITE

3.1 Population at Risk and Potential Exposure Routes

The facility rests approximately two miles west of the Annapolis City limits. Most of the residents in the surrounding area are on a municipal water supply. However, there are approximately ten domestic wells within a one-half mile radius of the site which are likely screened in the Aquia/Brightseat aquifer. None of these wells are located directly downgradient from the facility. Two public water supply well fields are located within one mile of the facility. One well field belongs to the City of Annapolis and contains six wells. The other well

field belongs to the Anne Arundel County Department of Utilities and contains three wells. Although these wells are downgradient from the site, they are drawing from the Magothy or Patapsco aquifers, deeper units in this area. Analytical data collected thus far indicates that these deeper aquifers have not been affected by the wastes discharged from the Honeywell facility, although the potential for their contamination exists.

Contaminated soils and sludges are on facility property underground and therefore pose no threat through direct contact.

Surface water runoff and shallow groundwater from the site discharge to a drainage ditch that rests between the facility property and MD Route 450. This ditch has been documented to contain levels of VOCs ranging from the detection limit to 5,700 ppb. The drainage ditch feeds into an unnamed tributary to the Broad Creek. No surface water intakes for drinking water are in this area. The possiblity of direct contact with surface waters in the drainage ditch does exist. This area is accessible to the surrounding population from along MD Route 450.

3.2 Potential Pathways for Contaminant Migration

Analysis of samples collected on and near the Honeywell facility indicate a release of VOCs to surface water and shallow groundwater and a release of metals to shallow groundwater. The potential for further migration of these contaminants through these pathways exists. The potential for air release of VOCs also exists once these compounds reach the air interface through the soils.

3.3 Potential Threat to the Public Health and the Environment

Several domestic and municipal water supply wells exist within a one-mile radius of the site. The potential exists for the contaminants which were placed in on-site dry wells to reach these area water supplies. These contaminants are already documented to be in shallow groundwater and surface waters in the study area. No contaminants have been detected in the municipal drinking water supplies. Five private domestic water supply wells have been sampled by the Anne Arundel County Health Department. No contaminants were detected.

Surface water and shallow groundwater in the area drains to a drainage ditch and to a tributary of the Broad Creek. Broad Creek in turn feeds the South River, a tributary to the Chesapeake Bay. The Broad Creek, South River, and Chesapeake Bay are important resources for recreation and seafood for the State of Maryland. The potential exists for the substances which were placed in on-site dry wells to reach these bodies of water through surface water.

The principal contaminants at Honeywell, Inc. are chromium, lead, and trichloroethene (TCE). Chromium and lead are priority toxic pollutants and TCE is a known carcinogen and a listed hazardous waste. Maximum Contaminant Levels (MCLs) for these substances in drinking water are as follows: chromium 0.005mg/1, lead 0.05mg/1, and TCE 0.005mg/1. The EP Toxicity MCL for chromium and lead is 5mg/1.

4.0 SAMPLING PLAN

4.1 Basis for Choosing Sample Types and Locations

Contamination of the site was caused by the disposal of metal plating liquids and solvents through the septic system and into dry wells at the rear of the facility. Soil, groundwater, and surface water samples will best characterize the extent of contamination and the potential for movement of the constituents off-site.

Honeywell's consultant has installed several monitoring wells on and off the facility property during their investigation at the site over the past two years. It will not be necessary to install any additional monitoring wells for the site investigation. The monitoring wells installed by Honeywell's consultant were installed by a subcontracted, licensed well driller in accordance with Maryland standards and regulations. The work plan for the well installation was preapproved by the Maryland Department of the Environment (MDE).

Monitoring wells previously installed will be used for collection of on-site and off-site groundwater data to be used in the Honeywell site inspection. These samples will adequately demonstrate whether or not groundwater degradation has occurred near the site. All purged water from monitoring well sampling will be containerized, sampled and then disposed of in a manner in accordance with Maryland regulations.

An intermittent stream lies downgradient and directly west of the site. This stream feeds an unnamed tributary to Broad Creek which runs west to east between the facility and MD Route 450. These surface waters provide adequate locations for sampling in order to determine the extent of contaminant migration through the surface water route. A surface water sample will be taken from the intermittent stream directly downgradient of the waste disposal area. Additionally, surface water samples will be taken from the unnamed tributary to Broad Creek, both above and below where the intermittent stream enters. Two additional surface water samples will be collected from the unnamed tributary and from a surface water drainage ditch which both run parallel to the site property.

Soil samples will be taken adjacent to two of the dry well structures and from the former waste isopropanol disposal area northeast of the production building. These samples will

adequately characterize the presence of wastes in on-site soils. Wastes deposited in dry wells will be sampled in order to demonstrate the presence of heavy metal and solvent wastes on-site in the dry well system and in the site soils.

Background groundwater, surface water and soil samples will also be taken during each of these sampling events. Upgradient groundwater and surface water samples will serve as background samples. Soil samples taken from the site away from areas of known waste disposal will be used for background soil samples. The locations from which the background soil, groundwater and surface water samples will be taken have been previously sampled and did not indicate the presence of any contaminants.

4.2 Sample Location Map (see Figure 4)

4.3 Type and Number of Samples to be Collected

Two soil samples and one waste material sample will be taken on-site in order to establish that wastes have been deposited in site soils and to identify the constituents of the wastes. The project manager will determine the exact locations of the soil samples during the SI and will make any necessary adjustments.

The first soil sample will be taken from the waste isopropanol disposal area which lies east of the dry well system at the edge of the woods near the facility building. A discrete sample will be taken from a depth of ten feet unless otherwise determined in the field. The sample will be attained by hand augering to a depth of ten feet and then collecting a sample from the 10-11 foot zone. Cuttings will be placed back into the boring hole.

A second discrete soil sample will be taken from directly adjacent to dry well #9 from the 25-26 foot zone. The Maryland Department of Environment (MDE) drill rig will be used to collect this sample and a split spoon sampler will be used. Cuttings will be placed back into the boring hole and the boring hole will be properly abandoned.

One sample will be taken of the waste material itself, which was deposited in the dry wells on-site. This sample will be taken from dry well #9 because this well contains the largest quantity of waste and also because the dry well has a large diameter opening, which makes sampling easier. The composite sludge sample will be collected from a depth of approximately 12-14 feet below the top of the dry well structure. The sample will be collected by using a two-inch (2") hollow black steel pipe which is driven into the sludge using a drill rig. The pipe will be equipped with a steel-toothed catch to retain the sample in the pipe.

One composite background soil sample will be taken from an area of the facility property where there is no known waste disposal. The sample will be collected in an area upgradient from the disposal system between monitoring well 7 (GM-7) and the facility building. A drill rig equipped with a two foot (2') split spoon sampler will be used to collect composite samples every ten feet to a total depth of 60 feet. An HNu meter will be used to screen each soil boring sample throughout the length of the boring.

The site is underlain by unconsolidated coastal plain sediments. In this area, the deposits consist of the Aquia, Brightseat and Magothy formations. Confining layers consist of the Monmouth/Matawan formation and the Potomac Group. The Aquia and Brightseat formations are hydraulically connected, while the Monmouth/Matawan formation acts as a confining layer, followed by the Magothy formation, a water bearing unit. Honeywell's consultant has installed monitoring wells which penetrate these formations down to the top of the confining unit (Monmouth/Matawan.) No monitoring wells have penetrated the confining unit. Annapolis City water supply wells are located within one mile of the site and are screened in the Magothy. Samples collected several times over the past year and a half did not indicate the presence of VOCs or metals above the detection limit in the Annapolis City water supply wells.

Six groundwater samples will be collected from existing monitoring wells installed by Honeywell's consultant. An HNu will be used to screen the well prior to sampling. Conductivity and pH readings will be taken in the field.

GM-7, located south and upgradient of the waste disposal area, will serve as the background groundwater sample. GM-7 is screened in the Aquia. GM-3, a shallow well located in the immediate area of the dry well system and also screened in the Aquia will be sampled in order to demonstrate that the contaminants have entered this uppermost aquifer. Also screened in the Aquia, are GM-8 and GMP-19, which are both downgradient from the dry well system. These two wells will be sampled in order to demonstrate that the contaminants which have entered the Aquia are traveling towards off-site to the north and northeast. GM-8 is on-site property approximately halfway between the site and an unnamed tributary to Broad Creek and GMP-19 is on off-site property adjacent to a drainage ditch at the bottom of the slope, just before MD Route 450.

GM-11 is screened in the lower Brightseat, and located in the immediate vicinity of the dry well system. It will be sampled in order to demonstrate that the contaminants have migrated to the bottom of the Aquia/Brightseat hydraulic unit.

GM-9, also screened in the lower Brightseat, will be sampled in order to demonstrate that the contaminants which have reached the lower portion of the Brightseat have also moved downgradient from the dry well system.

Five surface water samples will be taken from the nearby intermittent and perennial streams which feed Broad Creek. The first sample (SW-1) will be collected from the unnamed tributary to Broad Creek upstream from the influence of the facility in order to establish background surface water conditions in the area. Second and third surface water samples (SW-2, SW-3) will be collected from the unnamed tributary to Broad Creek and a surface water drainage ditch which both run parallel to the site property on opposite sides of MD Route 450. The samples will be collected from the streams at a location surficially downgradient from the waste disposal area in order to identify contaminants in the surface water. A fourth surface water (SW-4) sample will be taken from the unnamed tributary to Broad Creek downgradient from the site area to demonstrate that contaminants are moving off-site. A fifth surface water sample (SW-5) will be taken from an intermittent stream which lies directly downgradient and to the west of the waste disposal area.

The project manager will determine the exact locations for the surface water samples during the SI and will make any necessary adjustments.

One field blank sample will be taken for aqueous samples. Two duplicate samples will be taken, one of a soil sample, and one for an aqueous sample. All three samples will be analyzed in the CLP lab.

4.4 Analysis Parameters For Each Sample

Samples will be collected and analyzed according to procedures outlined in the State of Maryland Quality Assurance Project Plan for Site Inspections. Samples will be submitted to the EPA Contract Laboratory Program (CLP) for analysis. Aqueous samples will be analyzed for Routine Analytical Services (RAS) inorganic and organic pollutants. Soil samples will also be analyzed for RAS inorganic and organic pollutants. EP toxicity will be performed on soil samples that exceed the following total constituent parameters: lead, 5 ppm; silver, 5 ppm; arsenic, 5 ppm; barium, 100 ppm; cadmium, 1 ppm; mercury, 0.2 ppm. EP toxicity tests will be run as a Special Analytical Services (SAS) request.